NOTES ON INORGANIC CHEMISTRY.

The study of the influence of chemical composition on the coefficient of expansion of glass is one that has attracted considerable attention from both theoretical and practical standpoints. According to *Nature* an interesting *résumé* is given by M. A. Granger in the *Moniteur Scientifique*. In a few cases only the expansion follows an additive law proposed by Schott. A number of substances, such as the oxids of lead, calcium, manganese, aluminum and boron, lower the dilation when added in small quantities, but raise it when the proportion is increased. Potash, soda, lithia, fluorspar, lime or calcium phosphate raise the coefficient of expansion, but except in the case of the last not more than 8 per cent. can be added, as the glass either refuses to take up more or else becomes devitrified and opaque. Calcium borate, oxid of iron, alumina and silica lower the coefficient of expansion, alumina being especially active in this respect.

A second series of experiments on the action of water on metals is contributed to the last *Chemical News* by Robert Meldrum. The action on iron was noticed last week in this column. He finds that all waters tested have action on copper. Seven feet of one-sixteenth inch wire was used in each case. In five months distilled water had dissolved 0.055 parts per 100,000. Ammonia and carbon dioxid free water in 115 hours' exposure contained 0.1925 parts. A lake water containing 0.0056 free ammonia, 0.0126 albuminoid ammonia and 1.756 chlorin dissolved in 24 hours 0.099 parts. A water with no free ammonia, 0.001 albuminoid ammonia and 1.22 chlorin in 24 hours dissolved 0.023 parts copper. A town water supply with 2.07 chlorin and 3.0 organic matter dissolved in 94 hours 0.0825 copper, all in parts per 100,000. Sludge from a water tube boiler in use for some years contained 0.006 per cent. copper, showing the solvent action on copper and brass fittings. No zinc is mentioned as being present, though it is known that some waters exercise a decidedly solvent action upon the zinc in the brass, affecting but slightly the copper.

Experiments on lead were carried out by exposing the water in pieces of new lead pipe closed at one end. Two waters were tested: one (A) of a permanent hardness of 3.2° and a total hardness of 3.3°; the other (B) of permanent hardness 5° and total hardness 18.6°. In four hours A had dissolved 3.97 parts per 100,000 and B 0.049. When containing a small amount of carbon dioxid the solvent action was unchanged, but when almost saturated with carbon dioxid the solvent action of A was after the first half hour greatly increased. When saturated with calcium bicarbonate the solvent action was greatly decreased and when water A was agitated with calcium carbonate and then filtered, it ceased to have any solvent action. These experiments bear out the generally accepted view that hard waters take up little lead from lead pipes, but that soft waters and highly carbonated waters dissolve considerable quantities.

Continuing his investigations of the recently prepared crystallized calcium, Moissan describes, in the *Comptes Rendus*, its action upon nitrogen. In the cold no action takes place; at a gentle heat nitrogen is slowly absorbed; at a low red heat the calcium burns in nitrogen. In these two cases calcium nitrid is formed, of a bronze-yellow color. It is probable that the yellow color previously attributed to metallic calcium is due to the presence of more or less calcium nitrid. The calcium of Moissan is a white metal. Calcium nitrid is violently decomposed by water with the formation of ammonia and calcium hydroxid. It reacts

with carbon in the electric furnace, giving calcium carbid. Moissan suggests that calcium nitrid might possibly have some industrial importance in the formation of ammonia from atmospheric nitrogen.

IN the November number of the *American Chemical Journal* Professor Mallet describes an effort made to prepare what Sergius Kern had announced in 1877 as a new metal in platinum ore and named davyum. The metal possessed peculiar interest from its supposed atomic mass of 154, thus being a representative of a hitherto unknown group of platinum metals, lying intermediate between the two groups ruthenium, rhodium, palladium and osmium, iridium, platinum. Following Kern's directions and using residues furnished by Mr. George Matthey, of Johnson, Matthey & Co., Professor Mallet obtained a small residue, which agreed very closely with Kern's description of davyum. A careful examination showed that it was not elementary, but was composed of rhodium and iridium with a trace of iron. Thus the existence of an element davyum must be considered extremely doubtful.

IN the same journal Professor Keiser makes a contribution to the literature of the quantitative synthesis of water. In his experiments the hydrogen, oxygen and water formed were all weighed directly. His results give for the ratio of atomic mass of hydrogen to that of oxygen 15.874 when calculated from the ratio of hydrogen to oxygen used, and 15.886 when calculated from the ratio of hydrogen used to water formed. The mean 15.88 is thus very close to Professor Morley's figure of 15.879.

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CURRENT NOTES ON ANTHROPOLOGY.

EGYPTIAN ORIGINS.

A RUSH of papers has recently appeared discussing the origin of the ancient Egyptians. Most of them were suggested by De Morgan's work and excavations. A brief review of these, by Henry de Morgan, is in the 'Proceedings' of the American Numismatic and Archæological Society (fortieth meeting, 1898). Few of the writers altogether subscribe to De Morgan's theory of Asiatic origins. In *L'Anthropologie* (1898, Nos. 3 and 4) M. de Bissing, in a lengthy critique, condemns it as hasty and unfounded, claiming the elements of Egyptian civilization to be distinctly African. The distinguished Russian, Professor Anoutchine, and Schweinfurth, the traveler, both maintain that early Egyptian culture descends directly from the local neolithic period, and, while borrowing from Asia, was in no fair sense derived from that continent. This, too, is the position of Dr. E. Fraas, published in the *Correspondenzblatt* of the German Anthropological Society.

It is safe to conclude that De Morgan has by no means convinced his most competent critics.

YUCATECAN RUINS.

THE imposing ruins of a town known to the Indians as Xkichmook lie in a rocky valley about fifty miles east of Campeche. An accurate and fully illustrated report upon them by Mr. Edward H. Thompson is given in Volume II., No. 3, of the Field Columbian Museum publications. They consist of ten separate edifices of cut stone, mounds, terraces and reservoirs. Mural paintings are frequent, but mostly obliterated; incised figures are comparatively rare. Pottery is abundant, and also chipped stone implements; while polished stone objects are scarce. Obsidian is slightly represented, and metals were not exhumed.

The principal structure, called 'the Palace,' is an edifice of note. It towers eighty feet above the surrounding level, and its massive walls loom up like the face of some grim fortress.